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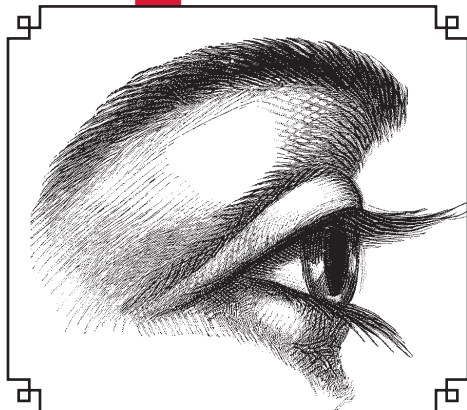
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# BiOMET

Center for Biomedical Engineering and Technology - University of Maryland School of Medicine  
in conjunction with the Fischell Department of Bioengineering, School of Engineering, University of Maryland, College Park

## "We can rebuild him..."



The line above is from the introduction to a classic 1970's sci-fi TV series, *The Six Million Dollar Man*. The premise of the show was that an astronaut who had a horrific accident was "rebuilt" with a bionic right arm, two legs and a left eye, leaving him with enhanced strength, speed and vision. But as many of us are aware, science fiction has prefigured science fact many times, and the desire to replace severely damaged body parts is still very strong. While there have been tremendous advances in limb prostheses, vision replacement has not been as easily addressed. However, the desire for that replacement is still there. Dr. Joseph Kao, an expert in biochemically caged biological molecules, has been participating in workshops hosted by the Clinical and Rehabilitative Medicine Research Program, US Army Medical Research and Materiel Command, looking at the possibilities of replacing vision in soldiers who have lost their sight. The first workshop was held March 19 - 20 and titled "The 'Art of the Possible' in Vision Restoration". Dr. Kao's presentation, entitled "Controlling Neurotransmission with Light and Caged Molecules," discussed one possible, less hardware oriented, approach to vision restoration. This

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### BIOMET SCIENTIFIC PROGRAMS

LABORATORY OF  
MOLECULAR CARDIOLOGY

LABORATORY OF  
NANOBIOLGY

LABORATORY FOR  
NEURODEGENERATIVE DISEASES

LABORATORY FOR  
PRION DISEASES

PROGRAM IN  
CANCER BIOLOGY

PROGRAM IN  
CELL STRUCTURE AND  
DEVELOPMENT

PROGRAM IN  
MITOCHONDRIAL DYNAMICS

## SOM Gala Highlights BioMET Director

After being feted last October as UMB Researcher of the Year, BioMET Director, W. Jonathan Lederer, MD PhD, was again in the spotlight, this time as a featured researcher at the University of Maryland School of Medicine Gala. A video presentation, including interviews with his UM collaborators, postdoctoral fellows and graduate students, was one of the after dinner highlights of this annual event. Galas are a time honored way of bringing together various stakeholders including philanthropists, to both thank them for past support and entice them to continue to support the institution. This year, the gala was included as part of the medical school reunion.

The gala was held in the convention center, which had both its advantages and disadvantages. The venue permitted the crowd to mingle freely in the large spaces, and there were distinct areas for pre-dinner cocktails, dinner and dancing/

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UNIVERSITY of MARYLAND  
SCHOOL OF MEDICINE



BioMET congratulates Dr. Myron “Mike” Levine on his appointment as Associate Dean for Global Health, Vaccinology and Infectious Disease in the School of Medicine. Dr. Levine was a member of the Scientific Advisory Board that established the Medical Biotechnology Center (MBC), the forerunner of BioMET, and the center’s co-director at one point. He was the founder of the Center for Vaccine Development (CVD) at UMB, which he led for 40 years. Dr. Levine was the first to hire Tim Hughes, MBC and BioMET’s first Assistant Director, and Mike McCrea, the facilities manager of BioMET’s former location on Lombard Street, for research positions in the CVD, though both moved on to administrative positions.

BioMET congratulates Dr. Yu Chen, a former BioMET retreat speaker, on his promotion to Associate Professor with tenure in the Fischell Department of Bioengineering.

## Two More BioMET Alumni

While research is the main activity of BioMET faculty, it goes hand in hand with mentoring and training the next generation of scientists. It is also an essential function of any academic institution. There is something very special about seeing bright, but not necessarily well-focused, young people blossom into insightful and dedicated scientists. BioMET was fortunate to have two such students complete their doctoral work this past year and to graduate this May, Moradeke Bamgboye and Dushon Riley. Both did their dissertation research in Dr. W. Jonathan Lederer’s laboratory. These two newly-minted BioMET alums will stay in Dr. Lederer’s laboratory as postdoctoral fellows for several months while finishing up manuscripts and the odd experiment or two, all the while pondering their next career move.

Dr. Bamgboye had done her thesis work on the effects of reactive oxygen species on heart function. Dr. Riley looked at the effect of stress, particularly that associated with diabetes, in relation to heart function.



*Left to Right: Drs. Dushon Riley, W. Jonathan Lederer and Moradeke Bamgboye*

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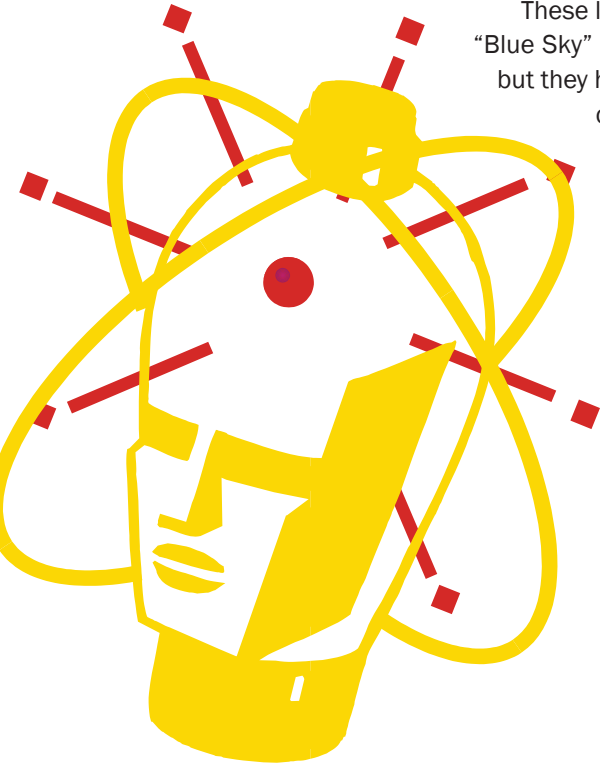
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first workshop led to the development of the Horus Vision Restoration Project Working Group. This group then held a follow-up meeting, held June 24, 2014. Dr. Kao was a panelist at this meeting.

These long range, almost hypothetical, research approaches are known as “Blue Sky” research or “Blue Sky Science.” Not only are they incredibly risky, but they have the potential to radically change current paradigms. They also can seem incredibly expensive, with no real benefits on the horizon.

However, they can be worth the risk, and the benefits in the long run may be substantial. These projects often bring together scientists who may never have the chance to interact in the usual course of their careers.

Dr. Kao has noted that most of what has occurred so far is just identifying possible approaches to the problem, with an emphasis on envisioning new ones, without considering the likelihood of success, particularly at this early juncture. Vision is a complex process involving the reception of light images, their transmittal and their interpretation in the brain. The complexity of reconstituting it artificially will require enormous effort and scientific creativity. BioMET is very proud that one of its own was invited to be part of this fascinating venture.

## GALA, CONTINUED

dessert. The only issues were the necessity for buses to go from UMB parking to the convention center, and the fact that hors d'oeuvres never seem to get around the entire cocktail area, which was quite extensive.

Members of Dr. Lederer's laboratory who had been involved in the video had been given complementary tickets, filling two tables. The guests included Dr. Christopher Ward from the School of Nursing and his wife. Dr. Ward is a long-term collaborator of Dr. Lederer's and had been interviewed for the video. Other guests from the laboratory included Dr. Lederer's long time laboratory manager Cecelia Frederick, graduate Students Mora Bamgboye, Libet Garber and Andrew Wescott, Postdoctoral Fellow Maura Greiser and Assistant Professor Guiling Zhao. Program Director, Dr. Brian Hagen, could not attend, so Assistant to the Director Pamela Wright used his tickets. The evening was rather drawn out but the desserts were well worth the wait.



*Dr. W. Jonathan Lederer and his wife,  
Dr. Jennie Rothschild.*



# BIOMET HAPPENINGS

## Comings and Goings

Dr. Didier Brochet has left Dr. Lederer's laboratory.

Our deepest condolences to Dr. G.S. Blair Williams on the sudden passing of his father.

## Publications

Kao JP, Muralidharan S, Zavalij PY, Fletcher S, Xue F, Rosen GM. Baeyer-Villiger Rearrangement of a Substituted Pyrrole by Oxone. Tetrahedron Lett. 2014 May 7;55(19):3111-3113. *This manuscript is a collaboration with the School of Nursing.*

Meng X, Kao JP, Kanold PO. Differential signaling to subplate neurons by spatially specific silent synapses in developing auditory cortex. J Neurosci. 2014 Jun 25;34(26):8855-64. *This manuscript is a collaboration with the Fischell Department.*

## Grants and Contracts

### Awards

Ilia Baskakov, 5/1/14, NIH, "Self-propagating mechanism of prion diseases," \$412,453, yr 3 of 5.

### Submissions

Shengyun Fang, 6/5/14, NIH "New Mechanisms for Maintaining Nuclear Proteostasis," Total Request: \$1,918,750

Mariusz Karbowski, 6/5/14, NIH, "Role of F-actin in mitochondrial homeostasis," Total Request: \$1,918,750

## Talks and Travels

Dr. Ilia Baskakov, International Meeting PRION 2014 in Trieste, Italy: Member of Scientific Advisory Board, Session Chair and Poster Judge, May 27-30, 2014.

Dr. W. Jonathan Lederer, Symposium speaker, "Ryanodine receptor function in cardiac stress," ISHR, North American Section Annual Meeting, Miami, May 12, 2014.

Dr. W. Jonathan Lederer, Speaker, "Microscopic in silico modeling of cellular arrhythmia mechanisms and therapeutic interventions" and "Why calcium signaling in heart is a complex problem – nanodomains and arrhythmia triggers," EuTrigTreat Closing Symposium, Berlin, Germany, June 13, 2014.

## MPower Update

*Editor's Note: While BioMET may not participate in all activities relating to the new initiative, the success of the entire enterprise benefits everyone. Thus, all activities of the new initiative will be highlighted in BioMET Now. As before, all members of the BioMET community are encouraged to look at the MPower web site at [mpowermaryland.com](http://mpowermaryland.com) for current information.*

The University of Maryland School of Medicine and the University of Maryland College Park's A. James Clark School of Engineering have initiated a combined MD-PhD in Bioengineering to meet the demand for both medical sciences and bioengineering expertise among health professionals. The combined degree is a direct result of the MPowering initiative. The School of Medicine's ongoing MD-PhD program will coordinate the degree choice.

## Fearsome Foursome Redux

Every spring UMB's URecFit organizes a golf tournament at Oakmont Greens Golf Club in Hampstead, Maryland as a fundraiser for the Department of Physical Therapy and Rehabilitation Science in the School of Medicine. For the past several years, Assistant Director Brian Hockenberry has arranged a foursome from BioMET, including himself, former Assistant Director Tim Hughes, BioMET Director W. Jonathan Lederer, and Professor Mervyn Monteiro. While Tim Hughes and Dr. Monteiro are avid golfers, Brian Hockenberry is only an occasional golfer, though his father was a pro, and Dr. Lederer rarely plays except for this tournament. Despite that, the group has a good time. They do not expect to win anything, but just enjoy the fellowship and a beautiful spring day.

The group expects to play next year, when the tournament celebrates its 30th year. The tournament will again be held at Oakmont Greens on May 21, 2015. If there are any other golfers out there, be sure to mark your calendar. Contact

Brian or keep track of the event on the URecFit. Who knows, maybe a BioMET team will finally win!



Left to Right:  
Mervyn Monteiro,  
Brian Hockenberry,  
Tim Hughes, W.  
Jonathan Lederer